IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An implantable cardiac rhythm management device comprising:

an input circuit adapted to receive a sampled signal including sampled data points corresponding to cardiac electrical activity;

a controller coupled to the input circuit and adapted to compute a curvature series using the sample data points, identify lobes each being an excursion of more than a curvature threshold value from a baseline in the computed curvature series, generate a series of characteristic points each associated with a time of a lobe of the identified lobes in the curvature series, and determine a fundamental frequency of the sampled signal by autocorrelating a function of the series of characteristic points, wherein the curvature series includes curvatures each ~~computed as~~ being a non-linear function of first and second derivatives of the sampled signal at one of the sample data points, and the controller is adapted to compute the first and second derivatives and the curvatures; and

a memory coupled to the controller and adapted to store the fundamental frequency.

2. (Previously Presented) The device of claim 1 wherein the controller is adapted to determine a size of each characteristic point of the series of characteristic points and determine the fundamental frequency as a function of the determined sizes.

3. (Previously Presented) The device of claim 1 further comprising a rate estimator coupled to the controller and adapted to generate a beat frequency, and wherein the controller is adapted to generate a heart rate based on the beat frequency and the fundamental frequency.

4. (Original) The device of claim 1 further including a telemetry circuit coupled to the controller and adapted to communicate to a programmer.

5. (Original) The device of claim 1 further including a therapy circuit coupled to the controller and adapted to deliver electrical stimulation as a function of a signal received from the controller.

6. (Previously Presented) A method comprising:

receiving sampled data points representative of a cardiac signal;

calculating a series of curvatures each as a non-linear function of first and second derivatives of the cardiac signal at one of the sample data points;

identifying lobes each being an excursion of more than a curvature threshold value from a baseline in the calculated series of curvatures;

establishing a series of characteristic points each corresponding to a time of occurrence of a lobe of the identified lobes in the series of curvatures;

using a processor to determine a frequency for the cardiac signal by autocorrelating a function of the series of characteristic points; and

storing the frequency in a memory.

7. (Original) The method of claim 6 wherein the time of occurrence of the lobe includes the time of occurrence of a centroid of the lobe.

8. (Previously Presented) The method of claim 6 wherein, for each characteristic point of the series of characteristic points, determining a size as a function of an area of the lobe, and wherein using the processor to determine the frequency for the cardiac signal includes determining the frequency as a function of the size of the each characteristic point.

9. (Original) The method of claim 6 wherein autocorrelating the function of the series of characteristic points includes autocorrelating a series of time differences for adjacent characteristic points as a function of time of occurrence for each characteristic point.

10. (Previously Presented) The method of claim 9 wherein autocorrelating the series of time differences for adjacent characteristic points as the function of time of occurrence for each

characteristic point includes evaluating a product of a time difference between adjacent characteristic points and a time difference between time shifted adjacent characteristic points.

11. (Original) The method of claim 10 wherein the adjacent characteristic points are in time overlap relation with the time shifted adjacent characteristic points.

12. (Original) The method of claim 6 wherein autocorrelating the function of the series of characteristic points includes autocorrelating a product of at least two factors selected from the series of characteristic points.

13. (Previously Presented) A method comprising:

receiving a sampled input signal being a function of sensed cardiac electrical activity;

using a processor to generate a curvature series by computing curvatures each as a non-linear function of first and second derivatives at a sample point of the sampled input signal;

identifying lobes each being an excursion from a baseline in the curvatures series using a curvature threshold value;

generating a series of characteristic points as a function of the curvature series, the characteristic points each associated with a lobe of the identified lobes in the curvature series and having a time as a function of a time of occurrence of the lobe of the identified lobes and a size as a function of an area of the lobe of the identified lobes;

autocorrelating a function of the series of characteristic points to determine a fundamental frequency of the sampled input signal; and

storing the fundamental frequency in a memory coupled to the processor.

14. (Original) The method of claim 13 wherein autocorrelating the function includes autocorrelating in a time domain.

15. (Original) The method of claim 13 wherein autocorrelating the function includes autocorrelating in a characteristic point domain.

16. (Previously Presented) The method of claim 13 wherein receiving a sampled signal includes receiving a ventricular rate electrogram, and wherein autocorrelating the function based on the series of characteristic points includes time domain autocorrelating a characteristic point time difference.

17. (Previously Presented) The method of claim 13 wherein receiving the sampled input signal includes receiving a defibrillation channel electrogram, and wherein autocorrelating the function based on the series of characteristic points includes time domain autocorrelating a characteristic point time difference function.

18. (Original) The method of claim 13 further including delivering therapy as a function of the fundamental frequency.

19-24. (Canceled)

25. (Previously Presented) An article comprising a machine-accessible medium having associated data wherein the data, when accessed, results in a machine performing:

receiving a sampled cardiac signal including sampled data points representative of the cardiac signal;

generating a curvature series using the sampled data points by computing curvatures each as a non-linear function of first and second derivatives of the sampled cardiac signal at one of the sampled data points;

identifying lobes each being an excursion of more than a curvature threshold value from a baseline in the curvature series;

generating a series of characteristic points in the sampled cardiac signal, each characteristic point corresponding to a lobe of the identified lobes in the curvature series and having a time corresponding to a time of occurrence of the lobe of the identified lobes;

determining a frequency by autocorrelating a function of the series of characteristic points, the frequency including a fundamental frequency of the sampled cardiac signal; and

storing the frequency in a memory.

26. (Previously Presented) The article of claim 25 wherein the data, when accessed, further results in the machine generating, for each characteristic point of the series of characteristic points, a size determined as a function of the area of the lobe in the curvature series.

27. (Original) The article of claim 26 wherein autocorrelating the function of the series of characteristic points includes autocorrelating the function of the series of characteristic points having the size greater than a predetermined value.

28-57. (Canceled)

58. (Previously Presented) An article comprising a machine-accessible medium having associated data wherein the data, when accessed, results in a machine performing:

receiving a first sampled signal including first sampled data points and a second sampled signal including second sampled data points, the first and second sampled signals each representing cardiac electrical activity for an epoch;

generating a first curvature series using the first sampled data points by calculating curvatures each as a non-linear function of first and second derivatives of the first sampled signal at one of the first sampled data points;

generating a second curvature series using the second sampled data points by calculating curvatures each being a non-linear function of first and second derivatives of the second sampled signal at one of the second sampled data points;

identifying first lobes each being an excursion from a baseline in the first curvature series using a first curvature threshold value;

identifying second lobes each being an excursion from a baseline in the second curvature series using a second curvature threshold value;

generating a first series of characteristic points in the first sampled signal and a second series of characteristic points in the second sampled signal, each characteristic point in the first series of characteristic points corresponding to a lobe of the identified first lobes and having a time corresponding to a time of occurrence of the lobe of the identified first lobes, each characteristic point in the second series of characteristic points corresponding to a lobe of the

identified second lobes and having a time corresponding to a time of occurrence of the lobe of the identified second lobes;

generating a classification of the epoch based on a plot of timewise occurrence of first series characteristic points relative to timewise occurrence of second series characteristic points and a separation contour; and

storing the classification in a memory.

59. (Previously Presented) The article of claim 58 wherein the data, when accessed, further results in the machine generating, for each characteristic point of the first series of characteristic points and the second series of characteristic points, a size determined as a function of the area of the lobe corresponding to the each characteristic point.

60. (Original) The article of claim 58 wherein the data, when accessed, further results in the machine generating a plurality of windows, each window disposed ahead of a characteristic point of the first series of characteristic points.

61. (Original) The article of claim 60 wherein generating the classification includes plotting a backward count based on a number of first series characteristic points having at least one second series characteristic point within a window of the plurality of windows and further includes means for determining a forward count based on a number of second series characteristic points disposed within a window of at least one first series characteristic point.